

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-20 and 28-35 are pending in the application, with claims 1, 6, 9, 10, 15, 16, 18, 28, 30, 31 and 35 being the independent claims. New claim 35 is sought to be added. The amendment is believed to introduce no new matter and its entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

***I. Support for New Claim 35***

Support for new claim 35 can be found throughout the specification, for example, at page 3, line 31, through page 4, line 30, and at page 9, line 16, through page 13, line 19 (Example 1).

***II. Withdrawal of Restriction Requirement***

The Examiner has withdrawn the Restriction Requirement set forth in the previous Office Action and indicated that claims 1-20 and 28-34 were examined. See Paper No. 19, page 2.

### **III. Claim Rejections Under 35 U.S.C. § 112, First Paragraph**

#### **A. Written Description**

Claims 1-20 and 29-34 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly lacking sufficient written description. *See* Paper No. 19, page 2. Applicants respectfully traverse this rejection.

According to the Examiner:

The claimed Cu,Zn-SOD correspond to sequences from other species, mutated sequences, allelic variants, splice variants, sequences that have a variant degree of identity (similarity, homology), and so forth. None of these sequences meet the written description provision of 35 U.S.C. 112, first, paragraph. The specification provides insufficient written description to support the genus encompassed by the claim.

Paper No. 19, page 3. Applicants respectfully submit that a person of ordinary skill in the art would recognize that Applicants, at the time of the effective filing date of the application, were in possession of the subject matter encompassed by the claims.

Claim 1 is directed to, *inter alia*, a pharmaceutical composition for vaccination comprising a bacterial Cu,Zn-SOD of the dimeric type, or a fragment, variant or derivative of the Cu,Zn-SOD, *wherein antibodies raised against said fragment, variant or derivative also bind intact full length Cu,Zn-SOD*. Hence, it is not only stated that derivatives, fragments and variants are claimed but also how a skilled person would determine whether such a fragment, variant or derivative has properties suitable for use in the compositions and methods of the present invention. The claim provides a functional definition of the antigens of the invention. In addition, there is discussion in

the specification (on page 4, lines 12-30) that provides definitions for the terms fragment, variant and derivative. There is also a description of the screening and identification of a monoclonal antibody that recognized a Cu,Zn-SOD isolated from different species of bacteria (page 9, lines 18-26). Thus, the present claims are supported by the written disclosure across their scope. Applicants therefore respectfully request that the rejection for insufficient written description be reconsidered and withdrawn.

***B. Enablement***

Claims 1-20 and 28-34 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. *See* Paper No. 19, page 5. Applicants respectfully traverse this rejection.

As mentioned above, claim 1 recites that the fragment, variant or derivative must be able to be bound by an antibody that is capable of binding full length wild type Cu,Zn-SOD. The disclosure in Example 1 (on page 9 of the description) provides teaching on how the skilled person would be able to produce suitable compositions according to the invention. At the very least, there is clear guidance as to how the skilled person would identify a fragment, variant or derivative as an appropriate vaccine antigen - *i.e.* by determining whether the candidate antigen was bound by a monoclonal antibody raised against a Cu,Zn-SOD from *Actinobacillus pleuropneumoniae*. Thus, it would have required no more than routine experimentation for a skilled artisan to make and use the full scope of subject matter encompassed by the current claims. Applicants

respectfully request that the rejection for lack of enablement be reconsidered and withdrawn.

**IV. Claim Rejections Under 35 U.S.C. § 102**

**A. Wilks**

Claims 1, 2, 4-8 and 9 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Wilks *et al.*, *Infection and Immunity* 66:213-217 (1998) ("Wilks"). See Paper No. 19, pages 8 and 9. Applicants respectfully traverse this rejection.

Applicants submit that Wilks does not teach compositions and methods that fall within the scope of claims 1, 2, 4-8 and 9. Wilks relates solely to the study of the pathogenicity of a SOD mutant meningococcus. Wilks identifies periplasmic SOD as a virulence factor. Wilks, however, does not describe a pharmaceutically acceptable extract of SOD and only shows the activity of SOD protein in a gel separation (see page 214, paragraph 3, third sentence). Further, it is the *sodC* mutant bacterium that is inoculated into mice (page 216, column 2, paragraph 2, third sentence) *not* the protein itself. Therefore, Wilks does not anticipate the present claims as Wilks does not make a composition containing the protein and does not use the protein to make a pharmaceutical composition. Applicants therefore respectfully request that the rejection under 35 U.S.C. § 102(b), based on Wilks, be reconsidered and withdrawn.

**B. Langford**

Claims 1-9 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Langford *et al.*, *Infection and Immunity* 64:5035-5041 (1996) ("Langford"). See Paper No. 19, pages 10 and 12. Applicants respectfully traverse this rejection.

Applicants submit that Langford does not teach compositions and methods that fall within the scope of claims 1-9. Langford mentions that Cu,Zn-SOD was isolated from *Actinobacillus pleuropneumoniae*. Applicants note, however, that the composition prepared by Langford contains copper sulfate (page 5035, fourth paragraph of Materials and Methods). Since copper sulfate is a toxic substance, the Langford composition is not in a pharmaceutically acceptable form. Langford is primarily concerned with the molecular characterisation of Cu,Zn-SOD and is not concerned with preparation of vaccine compositions. Hence, Langford does not anticipate the subject matter of claims 1-9. Applicants therefore respectfully request that the rejection under 35 U.S.C. § 102(b), based on Langford, be reconsidered and withdrawn.

**C. Wu**

Claims 1, 5-7 and 9 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Wu *et al.*, *FEBS Lett.* 439:192-196 (1998) ("Wu"). See Paper No. 19, pages 13 and 14. Applicants respectfully traverse this rejection.

Applicants submit that Wu does not teach compositions and methods that fall within the scope of claims 1, 5-7 and 9. Wu mentions that *sodC* was prepared from *M. tuberculosis*. Applicants note that *sodC* from *M. tuberculosis* is not a Cu,Zn-SOD of the dimeric type, as is recited in the claims. Therefore, Wu does not anticipate the subject

matter of claims 1, 5-7 and 9. Applicants therefore respectfully request that the rejection under 35 U.S.C. § 102(b), based on Wu, be reconsidered and withdrawn.

In addition, Wu was published in November, 1998, which is after the priority date of the present application (August 27, 1998), and less than one year before the International Filing Date (August 27, 1999). *See* PubMed abstract of Wu (copy submitted herewith as Exhibit 1), indicating a publication date of November 13, 1998. Thus, in addition to the fact that Wu does not teach all of the elements of the claims, Wu is not prior art to the present application.

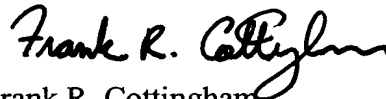
#### ***Conclusion***

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Date: NOV. 17, 2003

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